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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/085,527	02/28/2002	Gebhard Dopfer	99P03591US	9801

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SIEMENS CORPORATION  
INTELLECTUAL PROPERTY DEPT.  
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ISELIN, NJ 08830

EXAMINER

JOLLEY, KIRSTEN

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/085,527

Applicant(s)

DOPPER, GEBHARD

Examiner

Kirsten C. Jolley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12, 13 and 18-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12, 13 and 18-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Priority***

1. Applicant stated in the response of April 1, 2004 that he intends the instant application to be the national stage of International Application No. PCT/EP00/08049. Because the application transmittal form did not refer to examination under 35 USC 371 as a national phase entry, the application was processed instead as a 35 USC 111(a) application. In order to convert this application to a national stage application under 35 USC 371, Applicant is required to file a petition with the PCT Special Programs Division. Applicant should contact the PCT Help Desk at 703-305-3257 for specific instructions on how to file the petition, and what exactly is needed.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1-10, 12-13, and 18-25 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

3. Claims 21-22 are objected to because of the following informalities:

In new claim 21, line 2, "of a the spray" appears to contain a typographical error. The Examiner suggests deleting "a".

In new claim 22, line 2, it appears that "normal" should be replaced with --tangent-- upon review of the drawings.

Appropriate correction is required.

***Specification***

4. The disclosure is objected to because of the following informalities: As discussed above with respect to new claim 22, on page 6 of the specification, line 1, it appears that the term “normal” should be replaced with --tangent-- upon review of the drawings.

Appropriate correction is required.

***Examiner's Suggestions***

5. The Examiner notes that claims 6, 8, and 9 are awkwardly worded and suggests that Applicant clarify the claim language.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-10 and 12-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In line 11 of claim 1, the phrase “controlling a plurality of spray parameters *of the ceramic coating...* [emphasis added]” is to be new matter because the specification does not disclose that the spray parameters

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of the ceramic coating are controlled, but only that the parameters of the blasting process step are controlled. Because this appears to be a typographical error, the claims have been interpreted, for the purpose of examination, as requiring that the jet parameters of the blasting step are controlled as claimed, not the parameters of the ceramic coating step.

*Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-10, 12-13, and 18-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al. (US 5,520,516) alone or in view of McComas et al. (US Re. 35,611), and further in view of Kaiba et al. (US 6,096,132).

With respect to claims 1-4, 12, 18-19, 21, and 25, Taylor et al. discloses a method of applying a zirconium-based oxide ceramic coating to a metallic bond coated superalloy turbine blade tip of a gas turbine engine. Taylor et al. teaches that prior to coating, the blade tip should be roughened just prior to coating for the best bond strength (col. 3, lines 60-67). Taylor et al. teaches that the method for roughening can be abrasive grit blasting. It is noted that the tip of a turbine blade has a curved surface. Taylor et al. lacks a teaching of measuring a contour line geometry of the turbine blade tip, inputting the measured geometry into a control system, and controlling a plurality of spray parameters of the blasting system via the control system based on the geometry such that at least one of the parameters remains constant during the blasting.

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It is the Examiner's position that an engineer having ordinary skill in the art would have recognized that each of the blasting distance, intensity, angle, and time would directly affect the amount and degree of roughness produced on any given area on a substrate surface during an abrasive grit blasting process. Further, it is the Examiner's position that an engineer skilled in the art would have recognized that it is desirable to perform a constant amount of roughening over the entire substrate surface in order to produce a coated surface where the coating is evenly adhered to the entire substrate surface, thereby producing a uniform coating. For example, if a first region of the substrate is blasted for a longer period of time or with higher intensity or at a closer distance between the blasting apparatus and surface than a second region, then one skilled in the art would expect that the first region would result in a rougher surface than that blasted for a shorter period of time or with less intensity or from a farther distance. Therefore, it would have been obvious to one skilled in the art to have maintained at least one of the blasting distance, intensity, angle, or time constant along the contour of the substrate surface in order to form an even and consistently roughened surface, in order to ensure that the coating is uniformly adhered to the entire substrate surface.

Additionally, McComas et al. is cited as further evidence that consistent and uniform blasting is known and desirable when abrading turbine jet engine components such as turbine blades. McComas et al. teaches that critical parameters of its abrading process include nozzle distance from the surface and the liquid pressure (blasting intensity) (col. 3, lines 1-8). While McComas et al. discloses the use of blasting with water on a coated surface instead of abrasive grit blasting on an uncoated surface, both processes blast material at a surface using a jet for the purpose of abrading the surface

beneath, and therefore similar principles regarding blasting distance and blasting intensity would apply to both grit blasting and water jet blasting. It would have been obvious for one having ordinary skill in the art to have maintained a constant nozzle distance and constant blasting intensity during abrasive grit blasting in the process of Taylor et al., upon seeing the reference of McComas et al., in order to uniformly roughen the surface.

One having ordinary skill in the art having seen the reference of Taylor et al., alone or in combination with McComas et al., would have been motivated to look to the prior art for spray systems that are capable of maintaining a uniform spray along an entire surface of a curved substrate, so that the curved blade tip of Taylor et al. may be uniformly grit blasted and coated.

Kaiba et al. is cited for its teaching of an automatic painting device for use on a substrate surface having a curved shape, where the device is capable of keeping a constant interval between the spray gun heads and the surface to be painted. Kaiba et al. teaches measuring Z axis direction displacement distances at coordinate points along the surface, inputting the measured geometry into a control system, and controlling the spraying such that the distance from the spray head to the substrate surface remains constant when traversing over the entire curved surface (col. 4-5). It would have been obvious to one having ordinary skill in the art to have performed the abrasive grit blasting step of Taylor et al. using a spray control system as taught by Kaiba et al. in order to ensure that uniform blasting is performed along the entire three-dimensional curved blade tip surface, and also to provide an automatic blasting process thus improving efficiency.

As to claims 6-10, Taylor et al. teaches that the first metallic bond coating may be NiCoCrAlY, and the ceramic coating applied thereon is yttria stabilized zirconia (col. 6, lines 63-64).

As to claim 13, the apparatus of Kaiba et al. illustrates using an angle in the range of 20-90 degrees with respect to a curved surface. Alternatively, it is noted that McComas et al. teaches that blasting angle is a matter of preference, but an angle between 20-90 degrees may be used and 45 degrees is most preferred (col. 3, lines 9-22).

As to claims 5 and 20, while it is noted that Kaiba et al. does not teach that the blasting angle is maintained constant. However, it is the Examiner's position that it one skilled in the art would have recognized that different blasting angles would produce different results, specifically different degrees and locations of blasting. It would have been obvious for one having ordinary skill in the art to have maintained a constant blasting angle in the process of Taylor et al., as modified by Kaiba et al., in order to maintain a constant amount of roughening over the entire substrate surface and to produce a coated surface where the coating is evenly adhered to the entire substrate surface, thereby producing a uniform coating. Alternatively, it is noted that McComas et al. teaches that the blasting angle affects the fragment location post-blasting, and the direction helps to remove the fragments from the interaction zone thereby ensuring that they do not interfere with the blasting process (col. 3, lines 18-22). It would have been obvious to one having ordinary skill in the art to have maintained the blasting angle constant in order to consistently remove the blasted fragments from the interaction zone since changing the angle would cause the fragments to move in a different location and thus potentially interfere with the blasting/abrading process.



*Conclusion*

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hockett (US 4,545,156), Baughman (US 4,694,672), and Appel et al. (US 6,189,473) are cited as references directed to apparatus capable of abrasive blasting contoured surfaces.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Monday to Thursday and every other Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P Beck can be reached on 571-272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Kirsten C Jolley  
Patent Examiner  
Art Unit 1762

kcj